KNX AQS/TH-UP gl
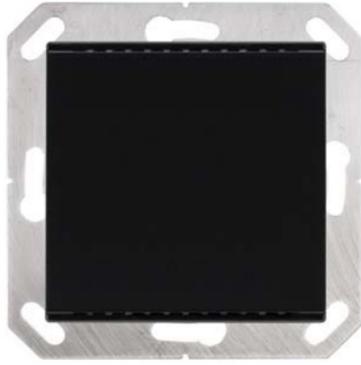# Combined Indoor Sensor

Technical specifications and installation instructions
Item numbers 70624 (white), 70625 (black)

1.   Description

The **Sensor KNX AQS/TH-UP gl** measures CO_2 concentration, temperature and humidity and calculates the dew point. The sensor can receive external measured values via the bus and process them with the own data to overall values (mixed values, e. g. room average).

The **KNX AQS/TH-UP gl** provides switching outputs with adjustable threshold values. The switching outputs and further communication objects can be linked by AND and OR logic gates. Additionally, an integrated actuating variable comparator can compare and output values that are received via communication objects.

Integrated PI controllers allows for control of a ventilation (depending on CO_2 concentration and air humidity) and a heating/cooling system (depending on temperature). The **KNX AQS/TH-UP gl** can emit a warning to the bus as soon as the area of optimum comfort (according to DIN 1946) is left.

The device is completed with a frame of the switching series installed in the building and thus merges with the interior.

Functions:
* Measurement of **CO_2 concentration** of the air, of **temperature** and **air humidity** (absolute and relative), calculation of the dew point
* **Mixed values** from own measured values and external values (proportions can be set in percentage)
* **PI controller for heating** (one or two step) and **cooling** (one or two step) depending on temperature. Control according to separate target values or basic target temperature
* **PI controller for ventilation** depending on humidity and CO_2 concentration: dehumidification/humidification (one step) or dehumidification (one or two step)
* **Threshold values** can be adjusted per parameter or via communication objects: 3 × temperature, 2 × humidity, 4 × CO_2
* **4 AND and 4 OR logic gates** with each 4 inputs. Every switching incident as well as 16 logic inputs in the form of communication objects, may be used as inputs for the logic gates. The output of each gate may optionally be configured as 1 bit or 2 x 8 bits
* **2 actuating variable comparators** for output of minimum, maximum or average values. Each with 5 inputs (for values received via communication objects)

Configuration is made using the KNX software ETS 5. The **product file** can be downloaded from the ETS online catalogue and the Elsner Elektronik website on **www.elsner-elektronik.de** in the "Service" menu.

1.0.1. Scope of delivery

* Housing
* Base plate

You will need *in addition* (not supplied):
* Socket Ø 60 mm, 42 mm deep
* Frame (for element 55 x 55 mm), suitable for the switching programme used in the building

1.1.   Technical specifications

Housing	ABS plastic material
Colours	• White • Black
Mounting	In-wall (wall mounting in socket Ø 60 mm, 42 mm deep, resp. cavity wall socket for hole Ø 68 mm)
Protection category	IP 20
Dimensions	Housing approx. 55 x 55 (W x H, mm), mounting depth approx. 8 mm, base plate approx. 71 x 71 (W x H, mm)
Total weight	approx. 53 g
Ambient temperature	Operation 0…+50°C, storage -10…+60°C
Ambient air humidity	max. 95% RH, avoid bedewing
Operating voltage	KNX bus voltage
Bus current	max. 20 mA
Data output	KNX +/- bus terminal plug

BCU type	Own micro controller
PEI type	0
Group addresses	max. 254
Allocations	max. 254
Communication objects	196
CO_2 measurement range	300...5000 ppm
CO_2 resolution	1 ppm
CO_2 accuracy	± 50 ppm plus ± 3% of the measured value (Mind the notes on *Accuracy of the measurement*, page 1)
Temperature measurement range	0…+50°C
Temperature resolution	0.1°C
Temperature accuracy	± 0,5°C at 0…+50°C (Mind the notes on *Accuracy of the measurement*, page 1)
Humidity measurement range	0% RH …95% RH
Humidity resolution	0.1%
Humidity accuracy	±7,5% RH at 0...10% RH ±4,5% RH at 10...90% RH ±7,5% RH at 90...95% RH
Humidity drift	± 0.5% R.H. per year in normal air

The product conforms with the provisions of EU guidelines.

1.1.1. Accuracy of the measurement

Measurement variations from permanent sources of interference (see chapter *Installation position*) can be corrected in the ETS in order to ensure the specified accuracy of the sensor (offset).

To ensure a correct **CO_2 measurement**, the device must be installed in a windproof socket.

When **measuring temperature**, the self-heating of the device is considered by the electronics. The heating is compensated by the software.

2.   Installation and commissioning

2.1.   Installation notes

Installation, testing, operational start-up and troubleshooting should only be performed by an electrician.

CAUTION!
Live voltage!
There are unprotected live components inside the device.
* National legal regulations are to be followed.
* Ensure that all lines to be assembled are free of voltage and take precautions against accidental switching on.
* Do not use the device if it is damaged.
* Take the device or system out of service and secure it against unintentional use, if it can be assumed, that risk-free operation is no longer guaranteed.

The device is only to be used for its intended purpose. Any improper modification or failure to follow the operating instructions voids any and all warranty and guarantee claims.

After unpacking the device, check it immediately for possible mechanical damage. If it has been damaged in transport, inform the supplier immediately.

The device may only be used as a fixed-site installation; that means only when assembled and after conclusion of all installation and operational start-up tasks and only in the surroundings designated for it.

Elsner Elektronik is not liable for any changes in norms and standards which may occur after publication of these operating instructions.

2.2.   Installation position

The **Sensor KNX AQS/TH-UP gl** is made for wall mounting in a socket (Ø 60 mm, 42 mm deep).
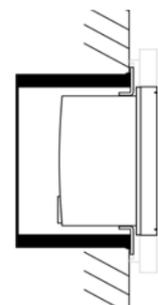

Fig. 1: Sectional drawing.
*The **Sensor KNX AQS/TH-UP gl** fits into a normal socket (Ø 60 mm, depth 42 mm).*

The frame is not included!

May be installed and operated in dry interior rooms only. Avoid condensation.

When selecting an installation location, please ensure that the measurement results are affected as little as possible by external influences. Possible sources of interference include:
* Direct sunlight

- Drafts from windows and doors
- Draft from ducts which lead from other rooms or from the outside to the junction box in which the sensor is mounted
- Warming or cooling of the building structure on which the sensor is mounted, e.g. due to sunlight, heating or cold water pipes
- Connection lines and ducts which lead from warmer or colder areas to the sensor

Measurement variations from permanent sources of interference can be corrected in the ETS in order to ensure the specified accuracy of the sensor (offset).

To ensure a correct CO_2 measurement, the device must be installed in a windproof socket.

2.3. Composition

2.3.1. Housing

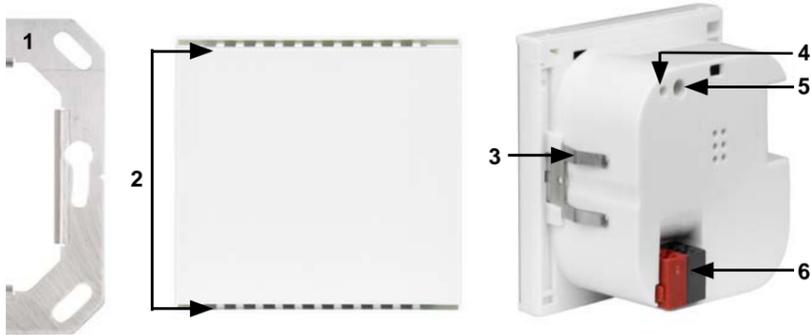*Fig. 2*
1   Base plate
2   Openings for air circulation
3   Catches
4   Programming LED (recessed)
5   Programming button (recessed) for teaching device
6   KNX terminal BUS +/-

2.4. Assembly of the sensor

First of all fit the windproof socket with connection. Also seal inlet pipes to avoid infiltration.
Screw the base plate onto the socket and position the frame of the switching programme. Connect the bus line +/- to the black-red plug.
Pin the housing with the notches on to the metal frame, so that device and frame are fixed.

2.5. Notes on mounting and commissioning

Never expose the device to water (e.g. rain) or dust. This can damage the electronics. You must not exceed a relative humidity of 95%. Avoid condensation.

After the bus voltage has been applied, the device will enter an initialisation phase lasting a few seconds. During this phase no information can be received or sent via the bus.